

CLAIMS

1. A voltage conversion device (12, 30) variably changing an input voltage to be applied to an inverter (14, 31) driving a motor (MG1, MG2), comprising:

5 a voltage converter (12) executing voltage conversion between a power supply (B) and said inverter (14, 31); and

a control device (30) controlling said voltage converter (12) by fixing a duty in a case where a voltage command value of said voltage conversion is at least a power supply voltage and at most a predetermined voltage.

10 2. The voltage conversion device according to claim 1, wherein said predetermined voltage is determined based on a dead time of said voltage converter (12).

15 3. The voltage conversion device according to claim 1, wherein in a case where said control device (30) controls said voltage converter (12) to decrease an output voltage of said voltage converter (12), said control device (30) fixes said duty when said voltage command value reaches a value of at least said power supply voltage and at most said predetermined voltage.

20 4. The voltage conversion device according to any of claims 1 to 3, wherein said voltage converter (12) variably changes said input voltage in a linear manner.

25 5. A voltage conversion device (12, 30) variably changing an input voltage to be applied to an inverter (14, 31) driving a motor (MG1, MG2), comprising:
a voltage converter (12) including an upper arm (Q1) turned on for a first on-duty and a lower arm (Q2) turned on for a second on-duty determined by subtracting said first on-duty from 1, and executing voltage conversion between a power supply (B)

and said inverter (14, 31) by switching said upper arm (Q1) and said lower arm (Q2);
and

a control device (30) controlling, in a case where said first on-duty calculated
based on a voltage command value of the voltage conversion by said voltage converter
5 (12) is influenced by a dead time of said upper arm (Q1) and said lower arm (Q2),
switching of said upper arm (Q1) and said lower arm (Q2) by fixing said first on-duty at
an appropriate on-duty with influence of said dead time removed therefrom.

6. The voltage conversion device according to claim 5, wherein

10 said control device (30) controls, in a case where said first on-duty calculated
based on said voltage command value is larger than a maximum effective on-duty and
smaller than a longest on-duty allowing said upper arm (Q1) to be turned on
continuously during a control period, switching of said upper arm (Q1) and said lower
arm (Q2) by fixing said first on-duty at said appropriate on-duty, and

15 said maximum effective on-duty is determined by dividing by said control period
an effective control period calculated by subtracting said dead time from said control
period.

7. The voltage conversion device according to claim 6, wherein

20 said appropriate on-duty is said maximum effective on-duty or said longest on-
duty.

8. The voltage conversion device according to any of claims 5 to 7, wherein
said voltage converter (12) variably changes said input voltage in a linear manner.

25 9. A computer-readable recording medium having a program recorded thereon
for a computer to control voltage conversion by a voltage conversion device (12, 30),
said voltage conversion device (12, 30) including a voltage converter (12) having

an upper arm (Q1) turned on for a first on-duty and a lower arm (Q2) turned on for a second on-duty determined by subtracting said first on-duty from 1, and executing voltage conversion between a power supply (B) and an inverter (14, 31) by switching said upper arm (Q1) and said lower arm (Q2), and

5 said program allowing said computer to execute:

 a first step of calculating said first on-duty based on a voltage command value of said voltage conversion;

 a second step of determining whether or not said calculated first on-duty is influenced by a dead time of said upper arm (Q1) and said lower arm (Q2); and

10 a third step of controlling, when it is determined that said first on-duty is influenced by said dead time, switching of said upper arm (Q1) and said lower arm (Q2) by fixing said first on-duty at an appropriate on-duty.

15 10. The computer-readable recording medium according to claim 9, wherein said second step includes:

 a first sub-step of calculating a maximum effective on-duty by using said dead time;

20 a second sub-step of determining whether or not said calculated first on-duty is larger than said maximum effective on-duty and smaller than a longest on-duty allowing said upper arm (Q1) to be turned on continuously during a control period;

 a third sub-step of determining that, when said first on-duty is larger than said maximum effective on-duty and smaller than said longest on-duty, said first on-duty is influenced by said dead time; and

25 a fourth sub-step of determining that, when said first on-duty is at most said maximum effective on-duty or equal to said longest on-duty, said first on-duty is not influenced by said dead time, and

 said maximum effective on-duty is determined by dividing by said control period an effective control period calculated by subtracting said dead time from said control

period.

11. The computer-readable recording medium according to claim 10, wherein
in said third step, switching of said upper arm (Q1) and said lower arm (Q2) is
5 controlled by fixing said first on-duty at said maximum effective on-duty or said longest
on-duty.